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*June 2003*

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## Poland: Environmental Issues

### Introduction

Since the demise of communism in Poland in 1989, environmental issues have risen on the Polish government's list of priorities. Prior to the political changes of that year, however, Poland's communist government blatantly disregarded the environment, and the push to develop the country's heavy industries meant that Poland was one of the most polluted countries in Europe. The Silesia region in southern Poland, with its coal mines, steel plants, and polluted environment, epitomized the communist government's emphasis on maximum industrial activity, regardless of the environmental cost. Along with parts of northern Bohemia and eastern Germany, the environmental devastation in southern Poland earned the region the infamous nickname, "The Black Triangle."

Poland has made great progress in improving its environmental record since the collapse of the country's communist regime. Poland's economic "shock therapy" closed down many inefficient, polluting factories, and new policies promoting environmental protection and energy efficiency have been introduced and continue to be implemented. In 1997, the Polish parliament adopted a new energy law defining the principles for developing a national energy policy. The law was intended to ensure that the Polish government provides efficient and rational use of fuels and energy for the country, taking into consideration environmental protection requirements.

As a result, industrial and agricultural discharges in Poland have been more than halved, and major air pollutant emissions have been significantly reduced. Much of the country's obsolete and inefficient power plants have been retrofitted with pollution prevention equipment in order to cut down on sulfur dioxide emissions. Regulations and legislation governing oil and gas development, as well as coal mining, have been upgraded to include better environmental protection measures. Nevertheless, there is still much room for improvement.

### Air Pollution

During the 1980s, Poland's Katowice district, which is part of the Silesia region, accounted for as much as 20%-25% of the country's total emissions of sulfur dioxide (SO<sub>2</sub>), nitrous oxides (NO<sub>x</sub>), and dust despite making up just over 2% of the country's land area. Concentrations of heavy industry in Silesia, in combination with scant regard for the environment, resulted in excessive levels of pollutants in the region. With extraction of approximately 200 million tons of coal per year at the largest brown coal basin in Europe adding to the emission levels, Silesia was plagued by severe acid rain, which practically destroyed the mountain forests and acidified the soils in the nearby Karkonosze and the Izerskie Mountains.

Since 1989, however, Poland has boosted governmental spending to combat air pollution, especially in the Black Triangle encompassing Silesia. Investments in air quality protection have risen

substantially, and the Polish government has passed relevant environmental legislation in an attempt to cut air pollution levels.

Under the "Krakow Air Monitoring Project," the U.S. Environmental Protection Agency (EPA), along with Polish environmental experts, worked to identify and measure the major sources of industrial, residential, and vehicle emissions plaguing Poland's second city. EPA financed the purchase of air monitoring and meteorological instruments to provide real-time air quality assessments. The Polish government then used these assessments to require several major industries to redesign their processes, install pollution controls, or shut down.

Likewise, the European Union's (EU) Integrated Pollution Prevention and Control (IPPC) Directive requires all member states to limit all emissions of gases, dust and sewage using "best available" technology by 2007. The IPPC directive is geared to prevent so-called "eco-dumping," whereby states transfer low-cost, but environment-polluting technologies to regions that cannot defend against it.

In order to meet EU standards concerning emissions of SO<sub>2</sub>, NO<sub>x</sub>, and particulates, the Polish government in 1998 enacted new environmental regulations for emissions from boilers, requiring installation of sulfur control technology (such as scrubbers or fluidized bed boilers). The Polish government's facility-specific, compliance determinations option gives power plants that are certified as environmentally EU-compliant tariff reductions earlier than non-compliant plants, a policy geared to encourage early adoption of EU requirements.

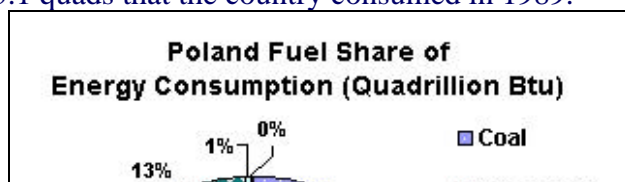
Nevertheless, Poland, which has been invited to join the EU in May 2004, has negotiated an extension in implementing the IPPC directive until 2010. Poland sought to ensure its power-generating plants an additional five to 10 years after entering the EU for reaching the organization's extremely strict standards of SO<sub>2</sub>, NO<sub>x</sub>, and dust emissions that were introduced in 2001. Poland applied for special treatment in three fields: the emission of nitrates (transition period from 2016 to 2022), sulfur dioxide (2008-2015) and dust (2008-2017). Poland also received an extension on implementing EU air pollution regulations from large combustion power plants until 2017.

However, the drop in pollution from stationary sources has been offset by an increase from mobile sources, something that Poland's State Inspectorate for Environmental Protection is keen to change. Still, the effects of these efforts to improve Poland's air quality have been dramatic: air pollution emanating from industrial sources has decreased by approximately 50%. As the stationary source problem has largely been addressed, the focus of Polish environmental efforts has shifted to developing effective pollution control strategies for the more challenging "non-point" and mobile sources, where pollution levels have increased since 1989.

### Energy Consumption

Coal accounted for the great majority of Poland's 2001 energy consumption, making up 62% of the total. Oil accounted for an additional 24%, while natural gas (13%) and hydropower (1%) made up the remainder. Among Central European countries, Poland consumes the most energy, with a 2001 total of 3.5 quadrillion Btu (quads). By comparison, the Czech Republic consumed 1.5 quads, Hungary 1.1 quads, Slovakia 0.8 quads, and Romania 1.6 quads. However, Poland's 2001 energy consumption was more than 30% lower than the 5.1 quads that the country consumed in 1989.

Polish energy consumption trends have mirrored the country's transition to democracy. Between the years 1989-1991, as inefficient mines and



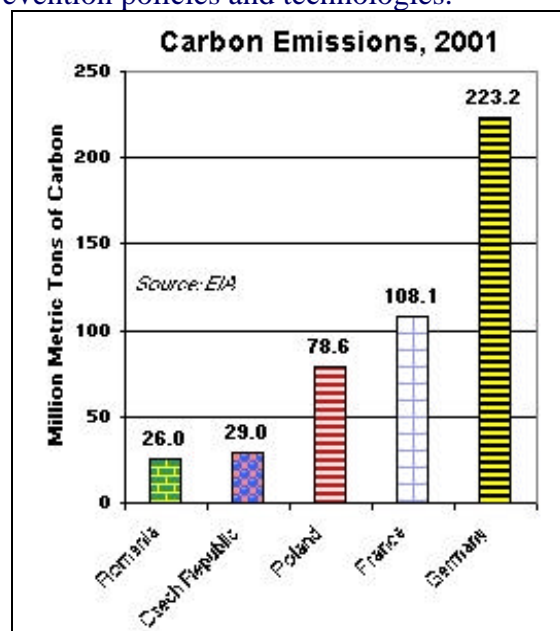
factories were closed, Polish industrial production decreased by over 35%. At the same time, a decrease in energy consumption (of approximately 25%) was evident, as well as a reduction in the emissions of major atmospheric pollutants (about 25% to 33%).

Starting in 1992, Poland's economy began to grow as it recovered from the loss of traditional markets and the shock of the country's initial transition away from central planning. However, despite the renewed industrial production, a more rational use of energy has meant that Poland's energy consumption has remained relatively stable, at levels approximately 30% lower than in 1989. This is due to the fact that old, ineffective factories where energy was wasted were eliminated, reducing energy use, while many others were modernized, equipped with the newest energy-saving technology. Thus, although industrial production has increased, energy use has remained relatively constant at a new lower rate.

### Carbon Emissions

Coal is overwhelmingly dominant in the production of electricity in Poland, with approximately 95% of all electricity generated in the country coming from coal-fired plants. The predominance of coal in Poland's energy production and consumption mix results in a great deal of carbon emissions and environmental pollution as well. The Polish government has restructured the coal industry to make it more efficient, applying improved pollution prevention policies and technologies.

As a result, since 1989, energy-related carbon emissions in Poland have decreased sharply, to 78.6 million metric tons of carbon, compared to an average of approximately 110 million metric tons emitted annually during the 1980s. By way of comparison, other transition countries such as Romania and the Czech Republic emitted 26 and 29 million metric tons of carbon in 2001, respectively. France, due to its extensive use of non-carbon emitting nuclear power, had carbon emission of just 108.1 million metric tons in 2001, while Germany's 2001 carbon emissions stood at 223.2 million metric tons.



Although Poland's industrial sector is emitting less carbon and other toxic substances now, one sector that has experienced a significant increase in emissions of atmospheric pollutants is the transportation sector. As in other former communist countries, Poland has experienced a dynamic rise in the number of cars since the late 1980s--between 1989 and 1995, the number of personal automobiles in Poland skyrocketed by approximately 70% while the number of trucks increased by approximately 40%.

Overall, per capita carbon emissions in Poland have followed a downward trend over the last two decades, with Poland's 2001 figure of 2.03 metric tons of carbon emitted per person far lower than the 1980 level of 3.26 metric tons of carbon emitted. Poland's 2001 per capita carbon emissions were on par with western European countries such as Germany (2.71 metric tons of carbon emitted per person), France (1.83), the United Kingdom (2.59), and significantly below the United States (5.51).

Poland is likely to meet its commitments as

Poland's Per Capita Carbon Emissions, 1980-2001

an Annex I country under the United Nations

Framework Convention on Climate Change. Under the Kyoto Protocol--which the Polish government signed on July 15th, 1998 and then ratified in August 2002 in advance of the World Summit on Sustainable Development in Johannesburg--Poland has agreed to reduce greenhouse gases 6% below its 1988 levels by the 2008-2012 commitment period.

By 2010, analysts estimate Polish CO<sub>2</sub> emissions will level off at a rate around 30% lower than the country's baseline year of 1988. That could translate into an estimated \$500 million to \$750 million in income from selling the permission to emit those gases to more industrialized countries.

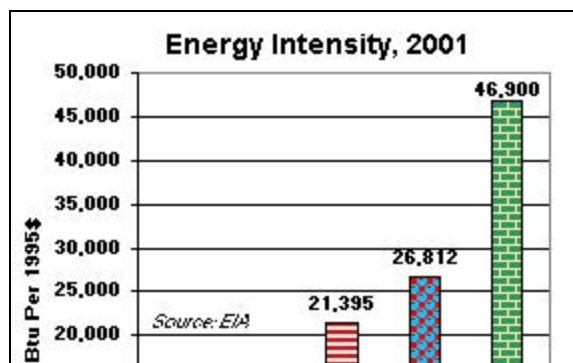
### Energy and Carbon Intensity

Poland has made great strides since 1989 to become more energy efficient. By implementing policies that encourage the rational use of energy and closing down inefficient industrial plants, the Polish government has reduced the country's energy intensity level significantly in the past decade. Poland's energy intensity level in 2001 stood at 21,395 Btu/\$1995--less than half its 1992 level of 48,738 Btu/\$1995 and still 36% lower than its 1989 level of 33,647 Btu/\$1995.

Poland's energy intensity level in 2001 compared favorably with two of its fellow transition countries, the Czech Republic (26,812 Btu/\$1995) and Slovakia (34,951 Btu/\$1995), both of which actually had lower energy intensity levels than Poland at the time of the breakup of Czechoslovakia on January 1, 1993. Still, Poland's energy intensity in 2001 was nearly double that of the US (10,736 Btu/\$1995) and more than four times that of its western neighbor Germany (5,312 Btu/\$1995), meaning that Poland still has room for continued improvement in the future.

Poland's level of carbon intensity has shown the same downward trend over time. In 2001, Poland's carbon intensity of 0.48 metric tons of carbon/thousand \$1995 was 37% less than in 1989, when the country's carbon intensity stood at 0.76 metric tons of carbon/thousand \$1995, and just 43% of its 1992 level (1.12 metric tons of carbon/thousand \$1995). Poland's 2001 carbon intensity level was on par with other transition countries such as the Czech Republic (0.51), Slovakia (0.45), and Hungary (0.27) but still high in comparison to European Union members such as Germany (0.08), France (0.06), and the United Kingdom (0.12).

Poland has adopted a number of measures in efforts to lower the country's energy and carbon intensities to Western levels, including a number of energy saving initiatives at the local level in the past few years. Among these initiatives are the elimination of coal-heated stoves and small ineffective boiler rooms, thermo-insulation of buildings, and the introduction of thermostats and energy meters in centrally heated buildings. Since 1989, the US Agency for International Development (USAID), the World Bank, the European Investment Bank (EIB), and the European Bank for Reconstruction and Development (EBRD) have all financed projects geared to help Poland improve its energy efficiency and use its resources more wisely.



In addition, Poland has adopted the "polluter pays" and "user pays" principles of environmental protection. Penalties for polluting the environment are collected by Poland's National Fund for Environmental Protection and Water Management, which has become one of the major financing sources for environmental ventures.

### Renewable Energy

Poland's renewable energy consumption is marginal,



with only about 0.7% (0.027 quads) of all energy consumed in 2001 coming from renewable sources. Of this, more than 80% came from hydropower, with the remainder coming from geothermal sources.

Aside from several small hydropower plants, Poland has no other significant renewable energy production in place, although there is potential for geothermal and biomass energy. In April 2003, the largest wind farm in Poland, comprising 15 turbines constructed by Danish power producer Elsam, came online. The Zagorze Wind Power Plant complex has the capacity to 70,000 MWh of energy, effectively doubling the power of wind power plants in Poland.

In line with EU regulations, Poland has set an ambitious program to expand its use of renewable energy. The country's renewable energy development plan calls for 7.5% of its energy to come from renewable sources in 2010, and 14% ten years later. Current EU regulations force energy companies to obtain 2.4% of sold energy from renewable or unconventional sources. This amount is to rise to 7.5% by 2010, with fines slapped on industries failing to abide by the official quotas.

### **Environmental Outlook**

Poland has made significant progress in improving its environment and bolstering its environmental legislation since the political changes in 1989. In fact, the country's economic development progressed to the point that the country "graduated" from USAID assistance in 2000. Still, economic growth has not been de-linked from environmental pollution, and the country's continued heavy reliance on dirty coal is an ongoing concern, as is Poland's ability to finance necessary cleanup projects.

In an effort to provide a legislative framework on which to base the country's future environmental protection efforts, in April 2001 the Polish government passed the Environmental Protection Act, a kind of "constitution" of environmental protection. The Act introduces the principle of well-balanced development into the Polish legal system. Similar to legislation in other, developed European countries, this principle aims to underpin appropriate and rational use of natural resources in Poland.

In addition to framework legislation and good-faith efforts, Poland will need money in order to "catch up" with Western European countries in terms of environmental protection. Currently, Poland spends about half of the EU member state average for environmental outlays in its annual budget. The Polish government has estimated that it will have to spend 40 billion euros--the amount equal to Polish public annual budget--in order to meet EU environmental criteria over several years after accession. The EU is expected to provide some 6 billion euros for ecological investments in the first three years of Poland's EU membership, but beyond that Poland will have to boost its environmental spending.

EU mandates geared to boost renewable energy sources should provide the incentive for Poland to reduce its coal usage. A shift is already underway in Poland from coal mining and heavy industry to modern services and lighter, more precise branches of production, such as car manufacturing, which should help ease pollution from stationary sources even further. In addition, the Polish government has begun implementing policies geared to change the country's energy consumption patterns to become more sustainable. Nevertheless, continued improvement of the country's environmental health will depend on Polish citizens acting on a local level to change individual patterns of energy consumption.

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